

# Condit Dam

## Overview of Project Decommissioning

September 25, 2012

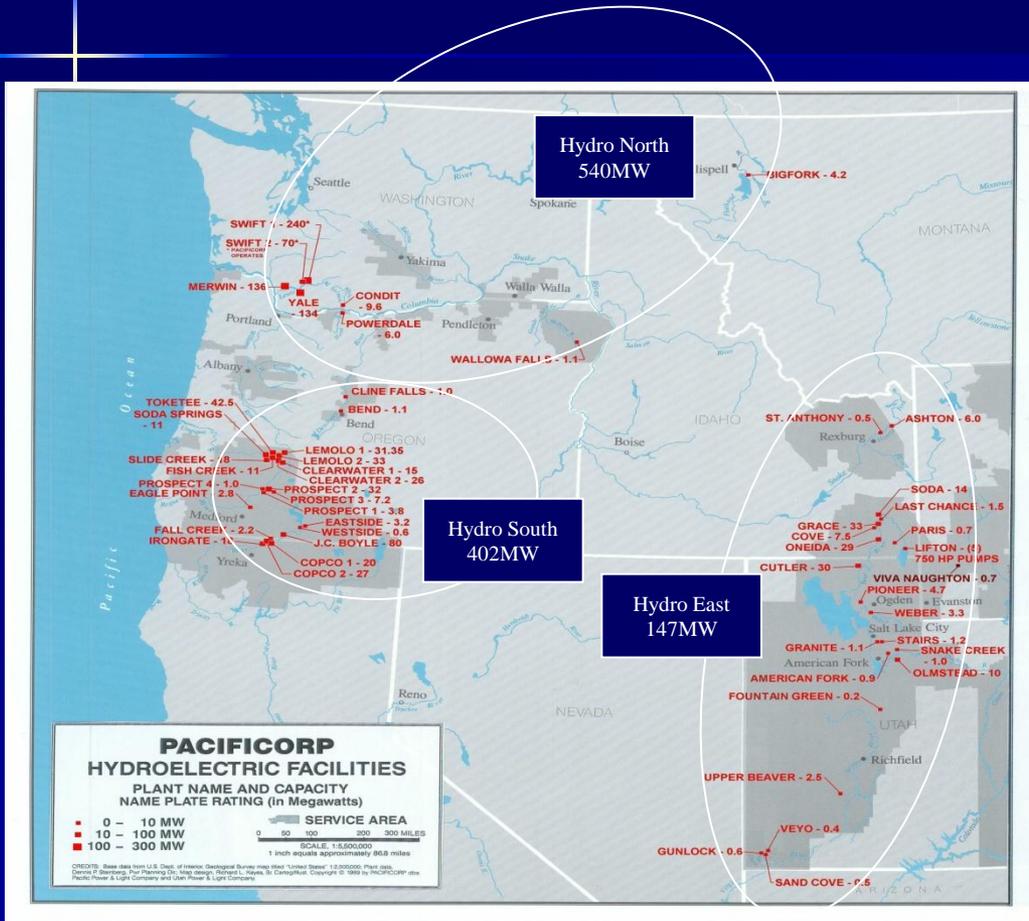
Todd Olson, Director Engineering & Environment

# Presentation Agenda

- PacifiCorp Energy Resources
- Condit Hydroelectric project
- Pre-breach activities
- Post-breach photos



# PacifiCorp Overview – System Map



**Hydro areas consist of 3 major production locations.**

**Hydro North  
9 facilities (540MW)**

**Hydro South  
19 facilities (398MW)**

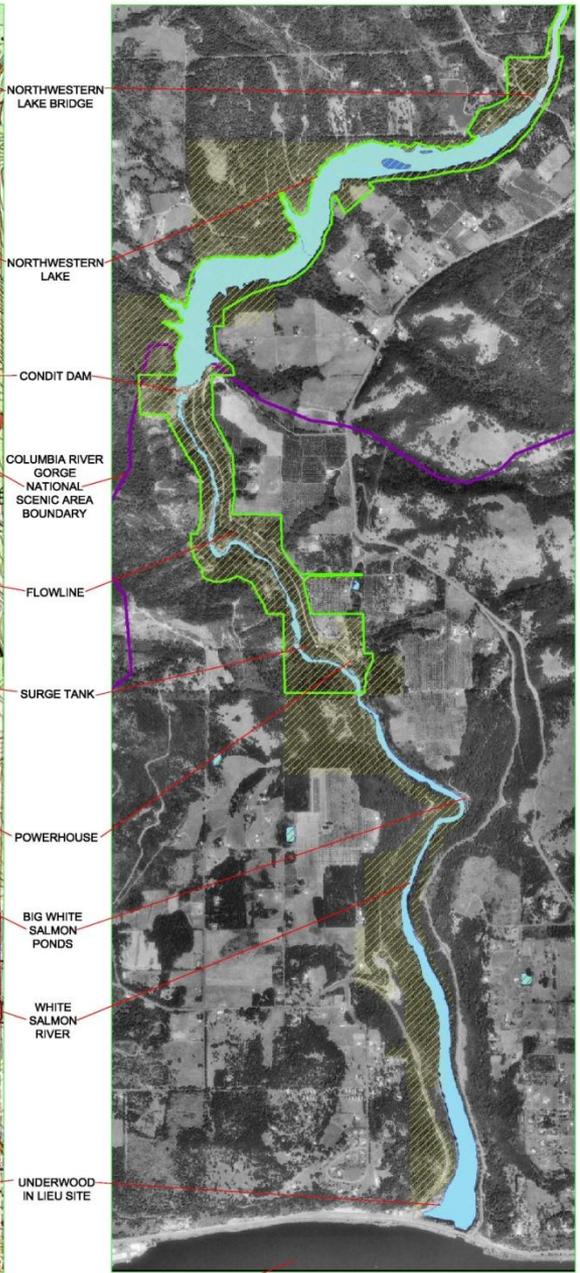
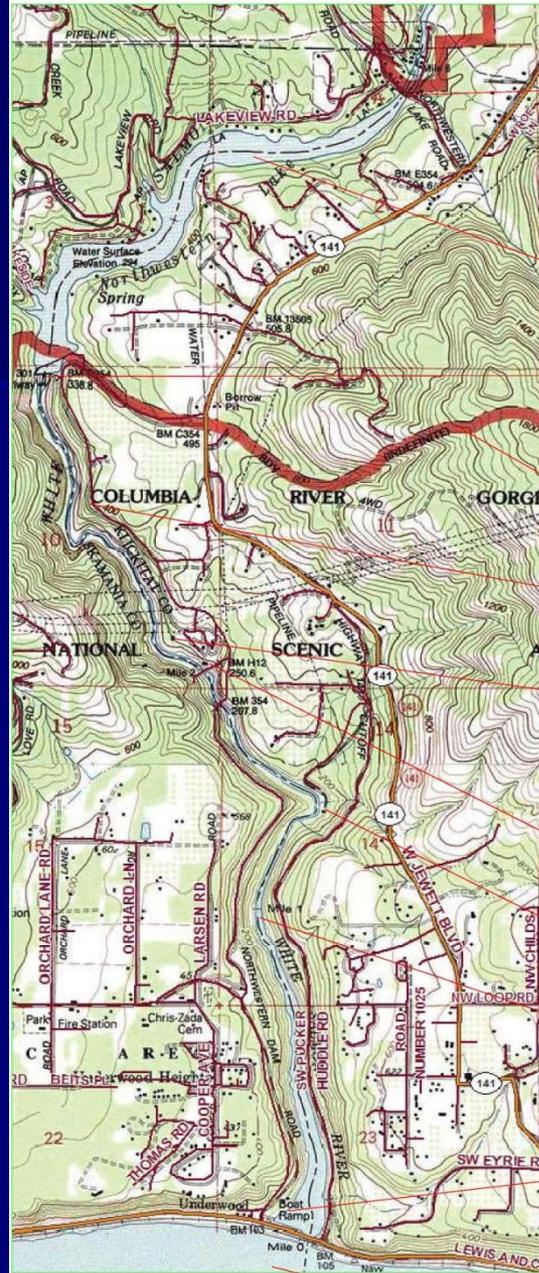
**Hydro East  
21 facilities (147MW)**

**Note: 1 Megawatt (MW) serves approximately 500 homes**

# Condit Project Overview

- Project is located near White Salmon, WA
  - 45-miles east of Portland, OR
- 3 miles upstream of the Columbia River
- Only man-made impoundment between Mt. Adams and the Columbia River
- Only one Columbia mainstem dam (Bonneville) between mouth of White Salmon River and Pacific Ocean

# Project Location



- NORTHWESTERN LAKE BRIDGE
- NORTHWESTERN LAKE
- CONDIT DAM
- COLUMBIA RIVER GORGE NATIONAL SCENIC AREA BOUNDARY
- FLOWLINE
- SURGE TANK
- POWERHOUSE
- BIG WHITE SALMON PONDS
- WHITE SALMON RIVER
- UNDERWOOD IN LIEU SITE
- COLUMBIA RIVER

**LEGEND**

-  5 PACIFICORP PROPERTY
-  FERC BOUNDARY

# Project Overview

## ■ Reservoir

- 11,000 feet long, covering 92 acres
- Supplied by 386 square mile basin that extends to Mt. Adams
- Contains 2.4 million yds<sup>3</sup> of reservoir sediment



# Project Overview

## ■ Dam

- Concrete gravity dam, 125' high by 471' long
- 250'-long spillway
- Ten 10'-high Obermeyer gates
- Five radial gates  
10'-wide x 10' high
- One vertical lift gate, 6' x 12'



# Project Overview

## ■ Water Conveyance

- 13.5' diameter by 5,100-foot long wood stave flowline
- 40-foot diameter concrete surge tank
- The flowline bifurcates into 2 penstocks, 9' diameter x 650' long
- One penstock is steel pipe, while the other is wood stave



# Project Overview

## ■ Powerhouse

- Generation: nameplate = 13.7 megawatts
- 2 double horizontal Francis turbines
- 77,850 megawatt hours of power per year



# Federal Energy Regulatory Commission

For continued operation, hydro owners are required every 30 to 50 years to file an application with the Federal Energy Regulatory Commission (FERC).

Application must include information on:

- Power resources
- Environmental resources
- Cultural resources
- Recreation resources
- Social economic resources

# Chronology of Major Events – Part 1

- |                   |  |
|-------------------|--|
| December 1988     | Initiated studies and compiled information to write the application  |
| December 1991     | PacifiCorp filed an application for a new FERC license   |
| April & June 1994 | U.S. Fish and Wildlife Service and NOAA Fisheries place fish passage conditions on the new FERC license  |
| October 1996      | FERC issues final Environmental Impact Statement (EIS) with mandatory conditions; cost is \$30 million   |
| November 1996     | PacifiCorp considers the new license to be uneconomical for its customers, it will cost more to build the fish passage and operate than to buy project replacement power from someone else |

# Settlement Agreement Process

- Rather than reject the FERC license and face years of litigation, PacifiCorp decided to initiate technical and settlement discussions with the intervenors.
- Dam removal became the focus of these discussions, but *the company would only continue if the costs were significantly less than the cost of installing fish passage facilities.*
- After nearly three years of negotiations among a very diverse group of interests, the Settlement Agreement was signed.
- Originally the project was to be removed in 2006, but date was extended to 2008 due to the extended time and increased costs for new permitting.
- Final permits and FERC Surrender Order received, 2011

# Parties To The Settlement Agreement

PacifiCorp  
American River  
American Whitewater Affiliation  
Columbia Gorge Audubon Society  
Columbia Gorge Coalition  
Federation of Fly Fishers  
Friends of the Earth  
Washington Department of Fish  
and Wildlife  
Washington Wilderness Coalition  
Columbia River United  
Friends of the Columbia Gorge  
Trout Unlimited

Columbia River Intertribal Fish  
Commission  
Yakama Nation  
National Marine Fisheries Service  
Friends of the White Salmon  
River  
U. S. Forest Service  
U. S. Department of the Interior  
Washington Department of  
Ecology  
Rivers Council of Washington  
Washington Trout  
The Mountaineers  
The Sierra Club

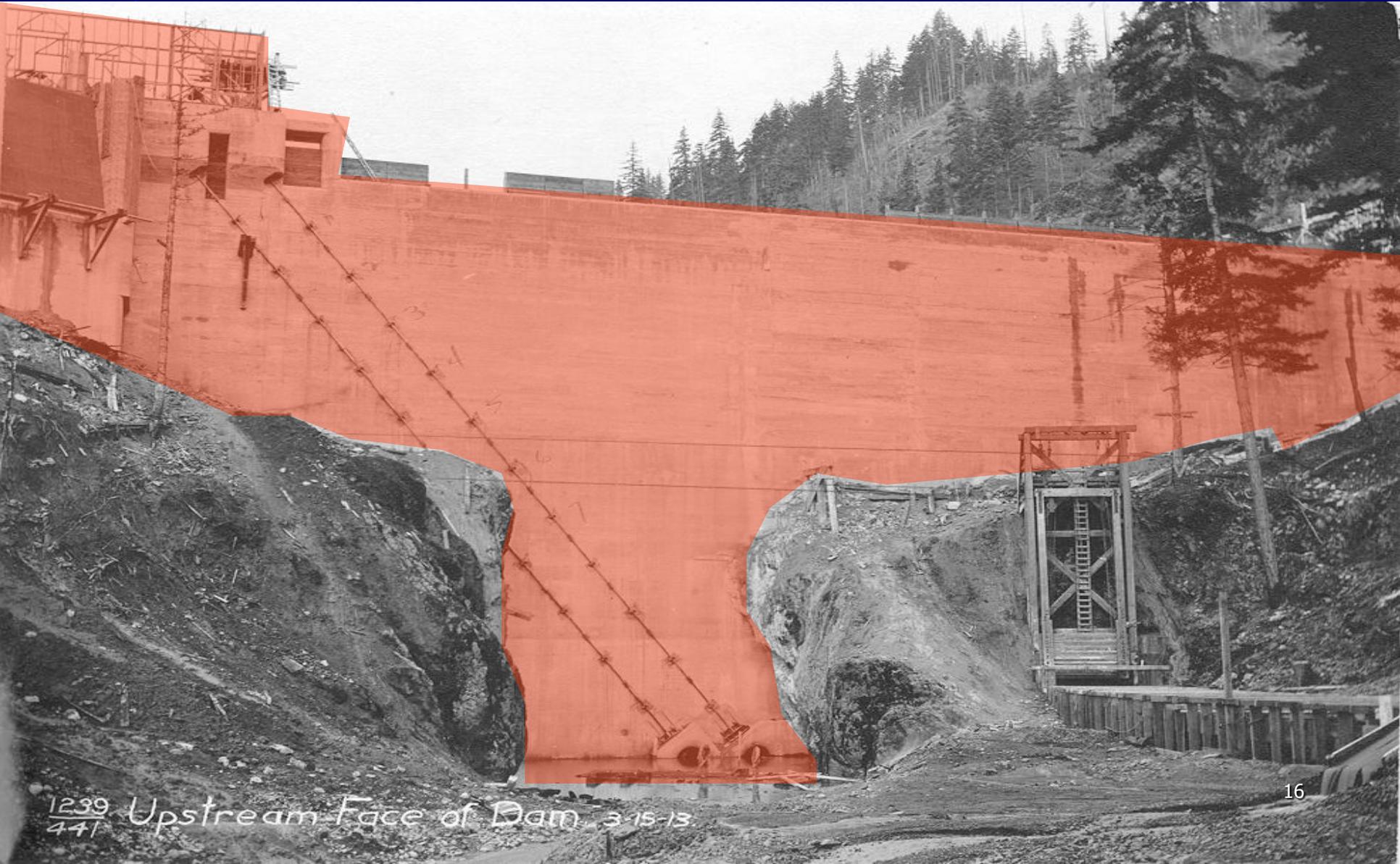
# Chronology of Major Events - Part 2

January 1997	PacifiCorp initiated settlement discussions with the interveners
September 1999	Settlement agreement signed with Federal and State agencies, environmental and tribal support with cost cap (approx. \$28.5m in 2010\$)
July 2000	FERC began National Environmental Protection Act (NEPA) process
May 2002	FERC issued their Final Supplemental Final Environmental Impact Statement endorsing dam removal
September 2002	U.S. Fish & Wildlife Service issued Biological Opinion
July 2004	Filed application for Sections 404 and 10 permits with the U.S. Army Corps of Engineers
February 2005	Settlement agreement amendment signed
September 2005	Department of Ecology released State Environmental Policy Act (SEPA) Draft Supplemental Environmental Impact Statement
November 2005	U.S. Fish & Wildlife Service filed supplement to Biological Opinion
October 2006	NOAA Fisheries issued Biological Opinion
January 2010	Department of Ecology releases SEPA Environmental Impact Statement
October 2011	Department of Ecology releases Clean Water Act 401 Certificate
December 2010	FERC issues Surrender Order
January 2011	PacifiCorp requests rehearing of Surrender Order
April 2011	FERC issues Final Order on Rehearing
April 2011	U.S. Army Corps of Engineers issues 404 Permit

# Facilities Removal - Dam



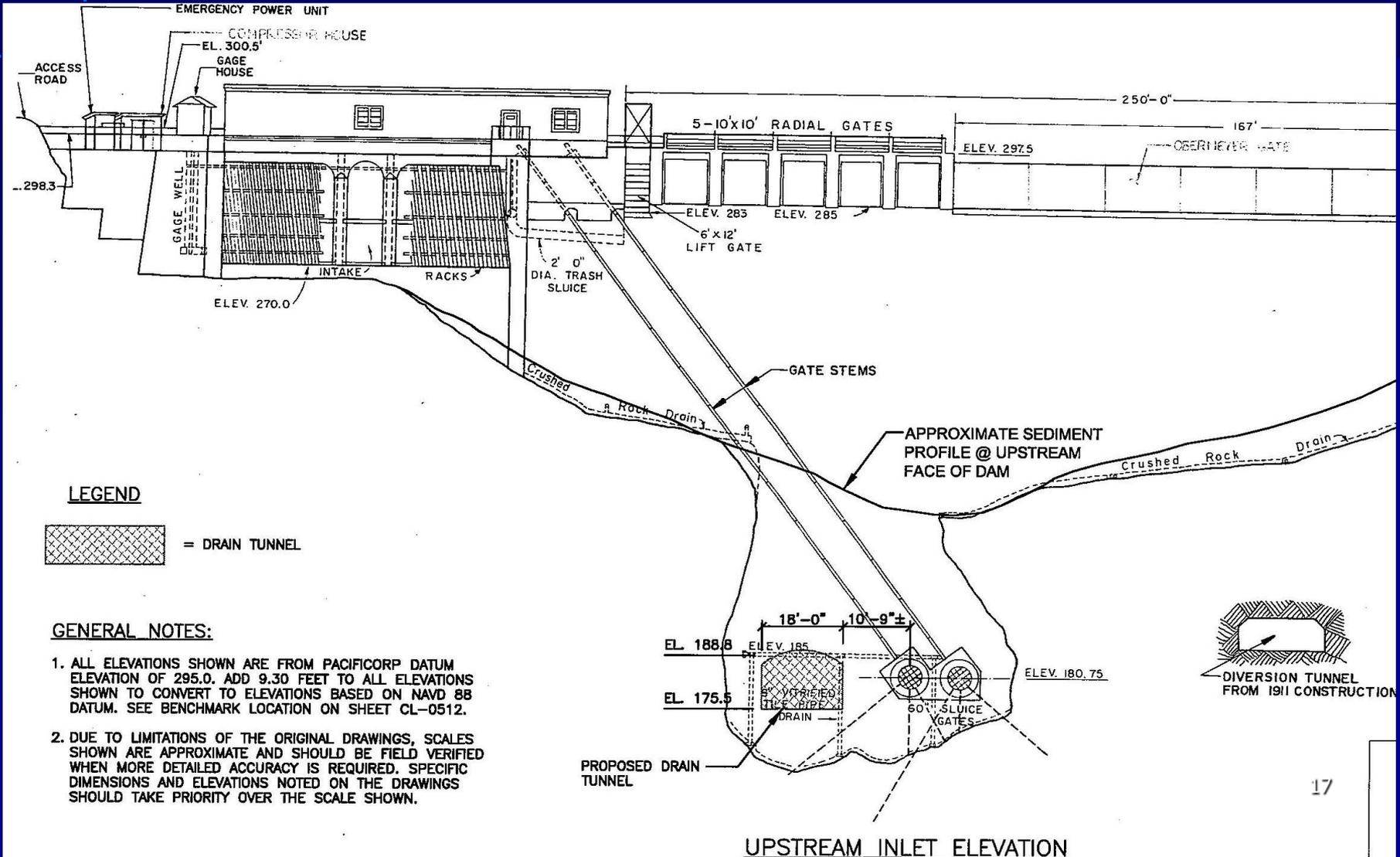
# Facilities Removal - Dam



1239  
441 Upstream Face of Dam 3-15-13

# Facilities Removal - Dam

Approx. 6 Hours to Drain with Maximum of 10,000 cfs Flow



# Facilities Removal - Dam

- Once reservoir is drained, tunnel to be kept open
- Conventional concrete removal
- Demolition to start at the top and successive layers broken into rubble
- Rubble will be transferred to burial site

# Facilities Removal – Surge Tank



# Facilities Removal – Surge Tank

- Interior electrical equipment removed
- Surge Tank will be collapsed and entombed
- Safety measures in spillway area
- Erosion Control Plan details cover and revegetation specifications



# Facilities Removal - Flowline



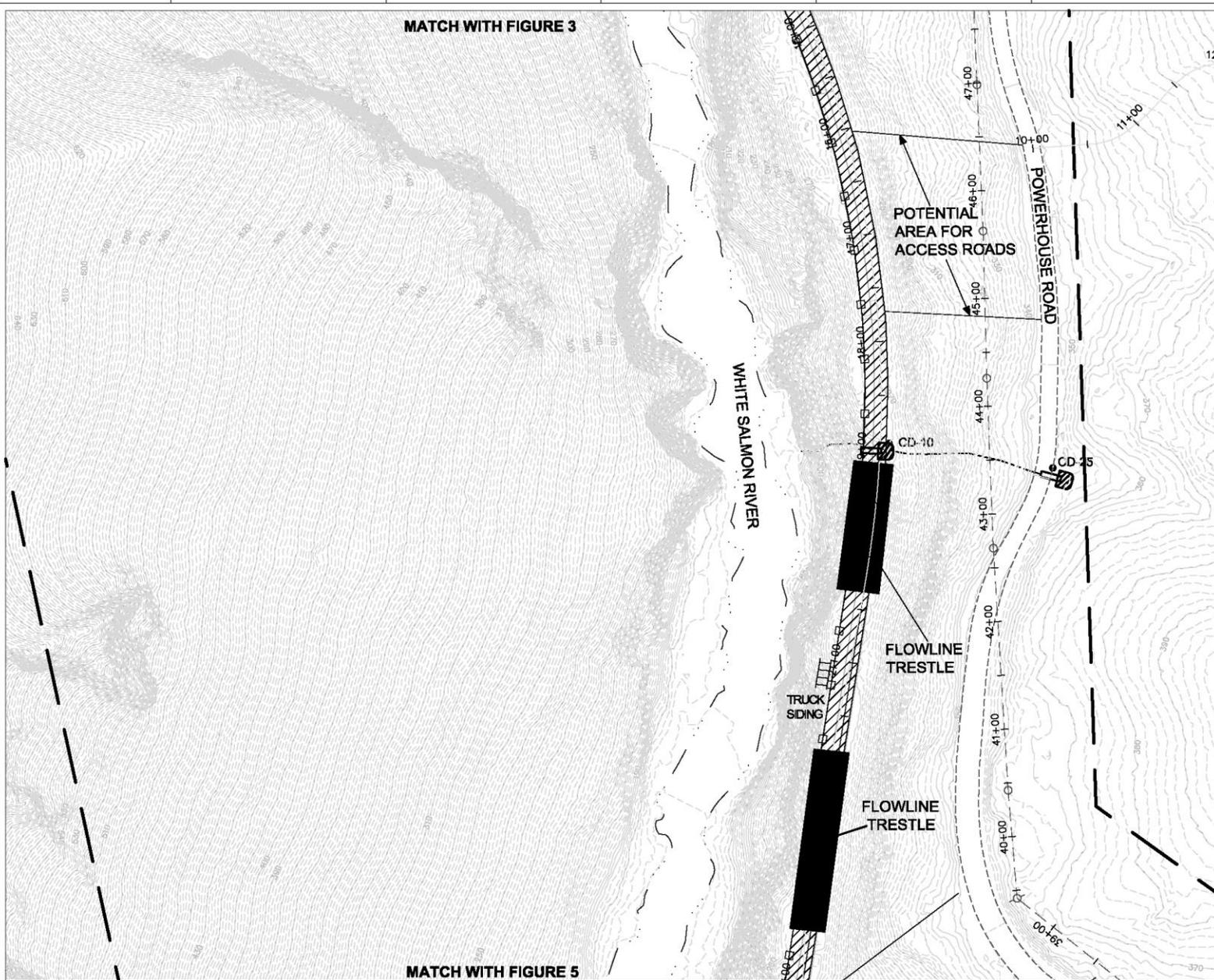
# Facilities Removal – Flowline & Penstocks

- Remove flowline timber framework, wood stave pipe, and concrete thrust block
- Use flowline alignment for concrete disposal
- Cover and revegetate for restoration
- Penstocks removed up to the powerhouse
- Seal penstocks with concrete bulkheads



MATCH WITH FIGURE 3

124



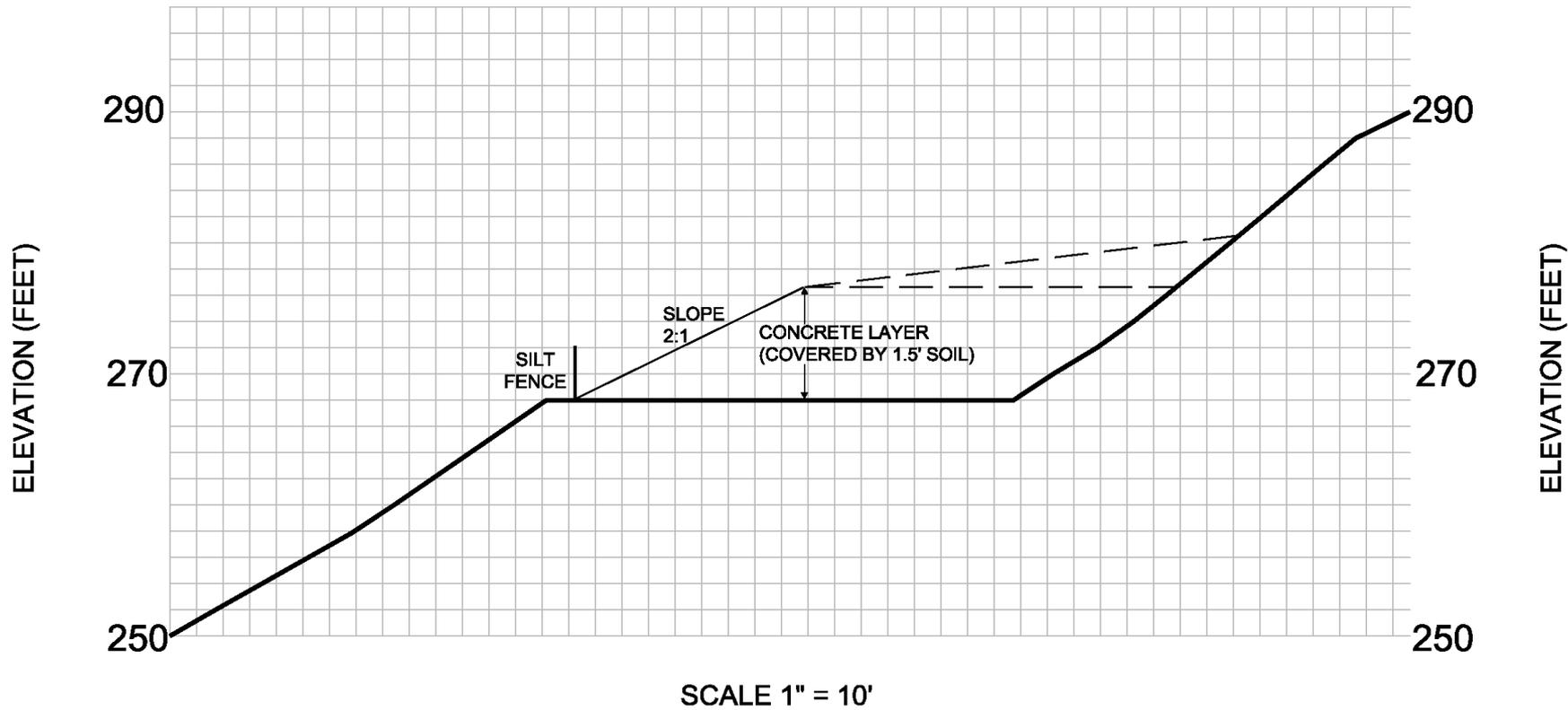
MATCH WITH FIGURE 5

**LEGEND**

	INTERMITTENT STREAMLET		CULVERT INLET PROTECTION		AREA OF CONCRETE DISPOSAL
	SILT FENCE		ACCESS LADDER		TIRE BATH
	CD-44 SURVEY POINTS		STAGING AREA BOUNDARY		ACCESS ROAD ALIGNMENT

SCALE  
0 25 50 100  
(in feet)

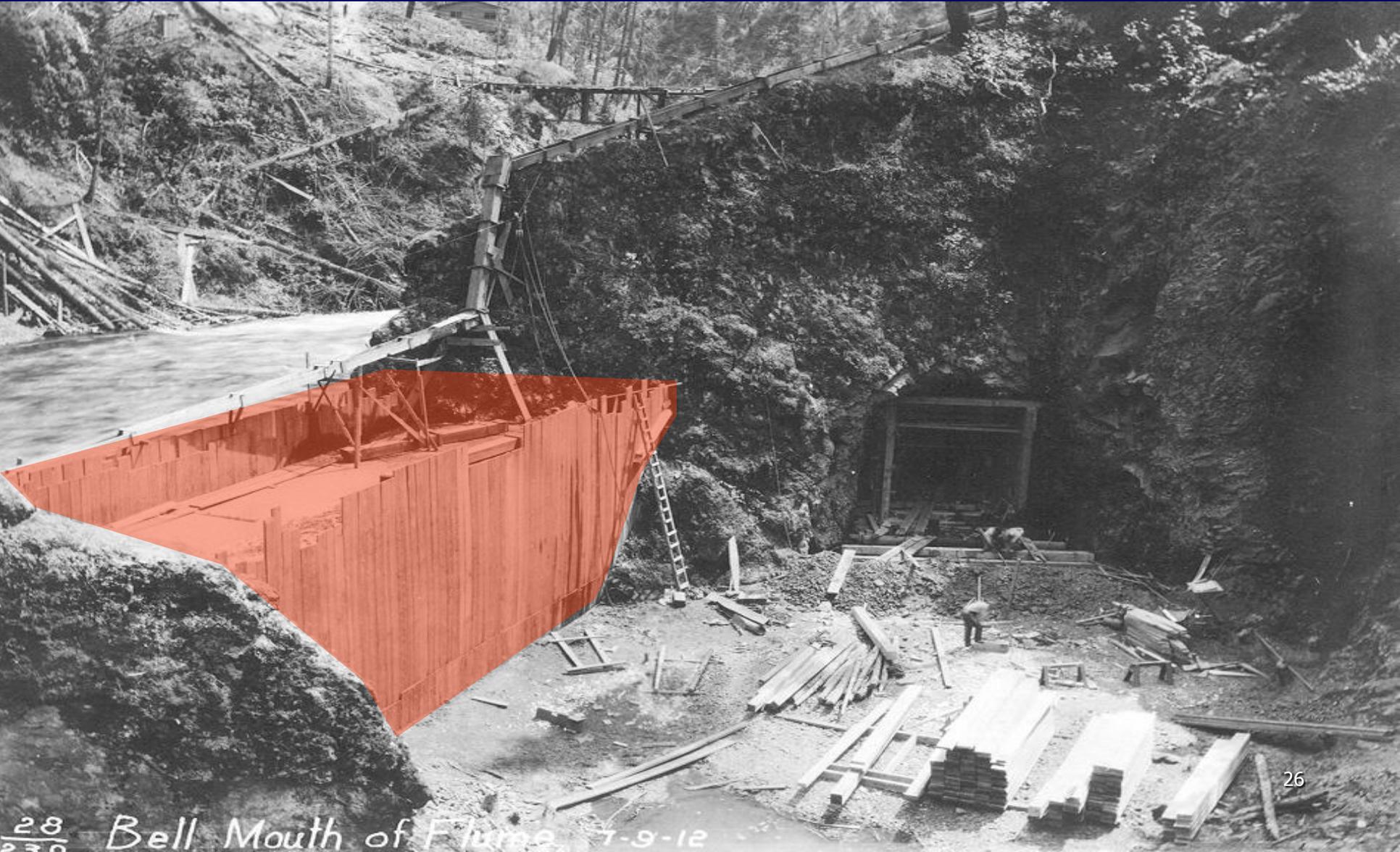
**KLEINFELDER**  
Bright People. Right Solutions.  
15050 S.W. Koi Parkway, Suite L  
Beverly Hills, OR 97008  
(503) 544-9447  
www.kleinfelder.com



# Facilities Removal – Flowline & Penstocks

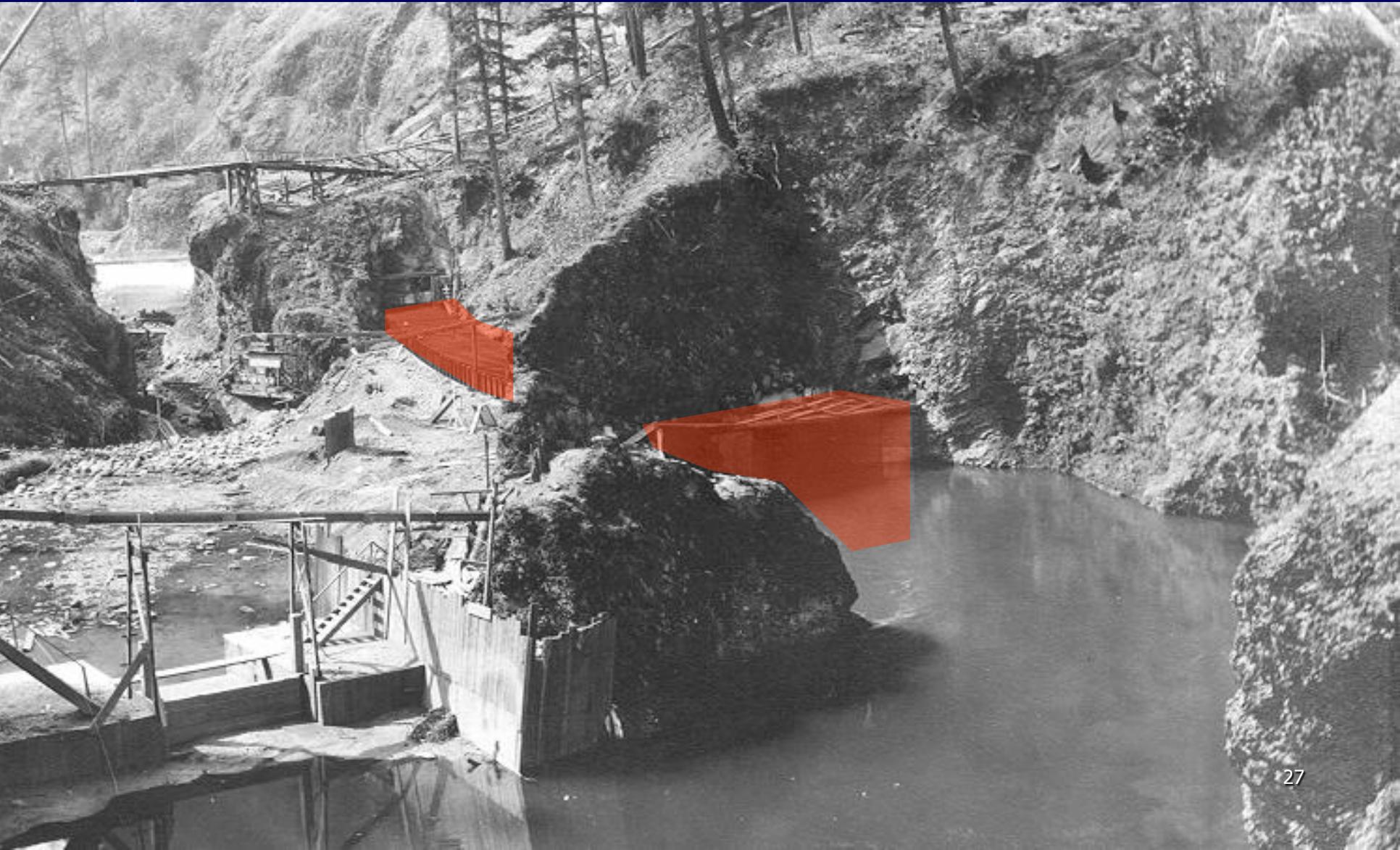


# Facilities Removal – Cofferd Dams



$\frac{28}{230}$  Bell Mouth of Flume 7-9-12

# Facilities Removal – Tunnels & Flumes



# Facilities Removal – Tailrace



# Chronology of Major Events - Part 3

August 2011	Decommissioning efforts begin
October 2011	Generation ceases and dam is breached
January 2012	Demolition of dam is initiated
February 2012	Grading of former reservoir area begins
April 2012	Coffer dam is removed to open fish passage
July 2012	Adult Steelhead observed upstream of project area
September 2012	Dam completely removed
September 2012	Grading of reservoir area completed
Fall 2012	Vegetation planting in disturbed areas
2013 to 2021	Monitoring of environmental conditions within former project area

# Reservoir Drawdown



# Big White Pond Weir Install



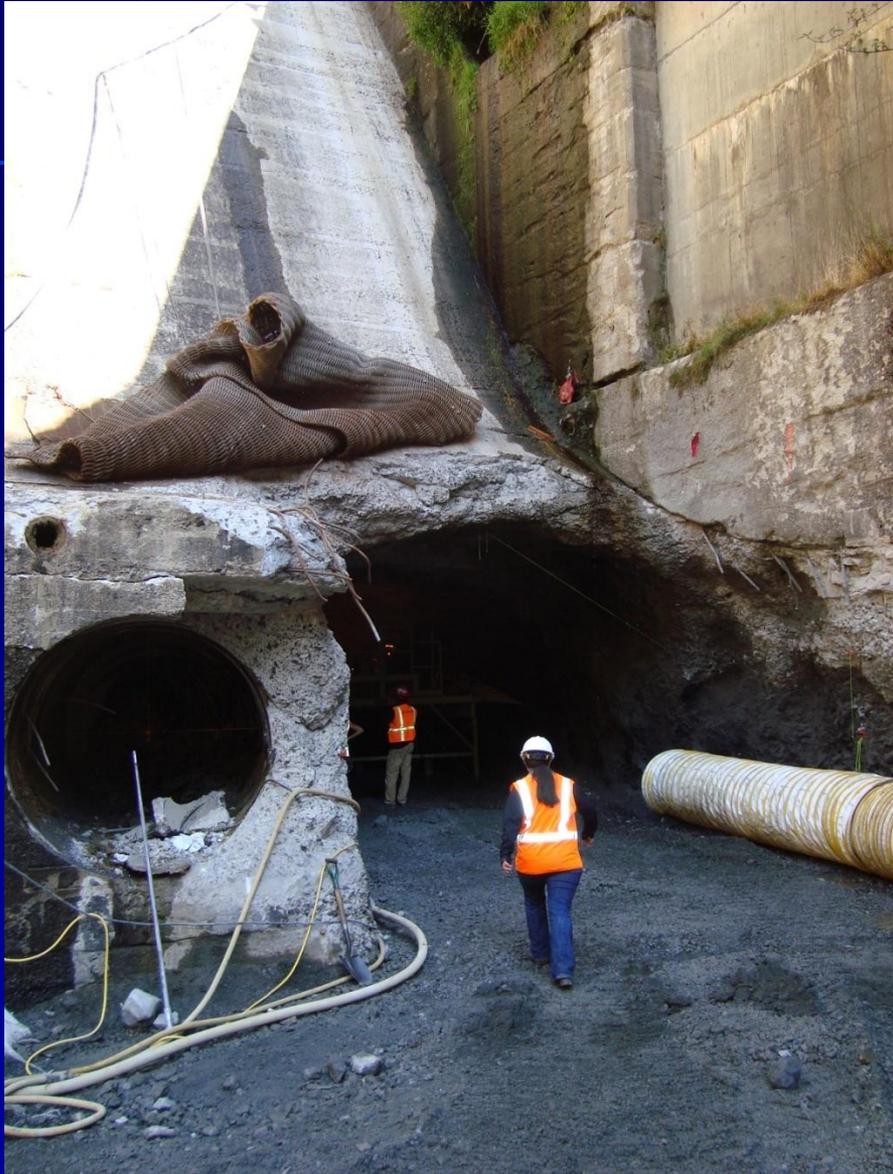
# Fish Salvage



# Tunneling Begins



# Tunnel – Outside & Inside



# Sediment depth - dredging



## Key Element:

Clearing pathway for water and sediment to enter breach tunnel

# Dredging sediment - looking for one of the original coffer dams and woody debris



# Breach day – October 26, 2011

## The Blast



# Breach day – October 26, 2011

## Reservoir Before



# Breach day – October 26, 2011

## Reservoir After



# Post Breach Activities

## Public Safety



# Post Breach Activities

## Public Safety



# Post Breach Activities

## Old Cofferdam

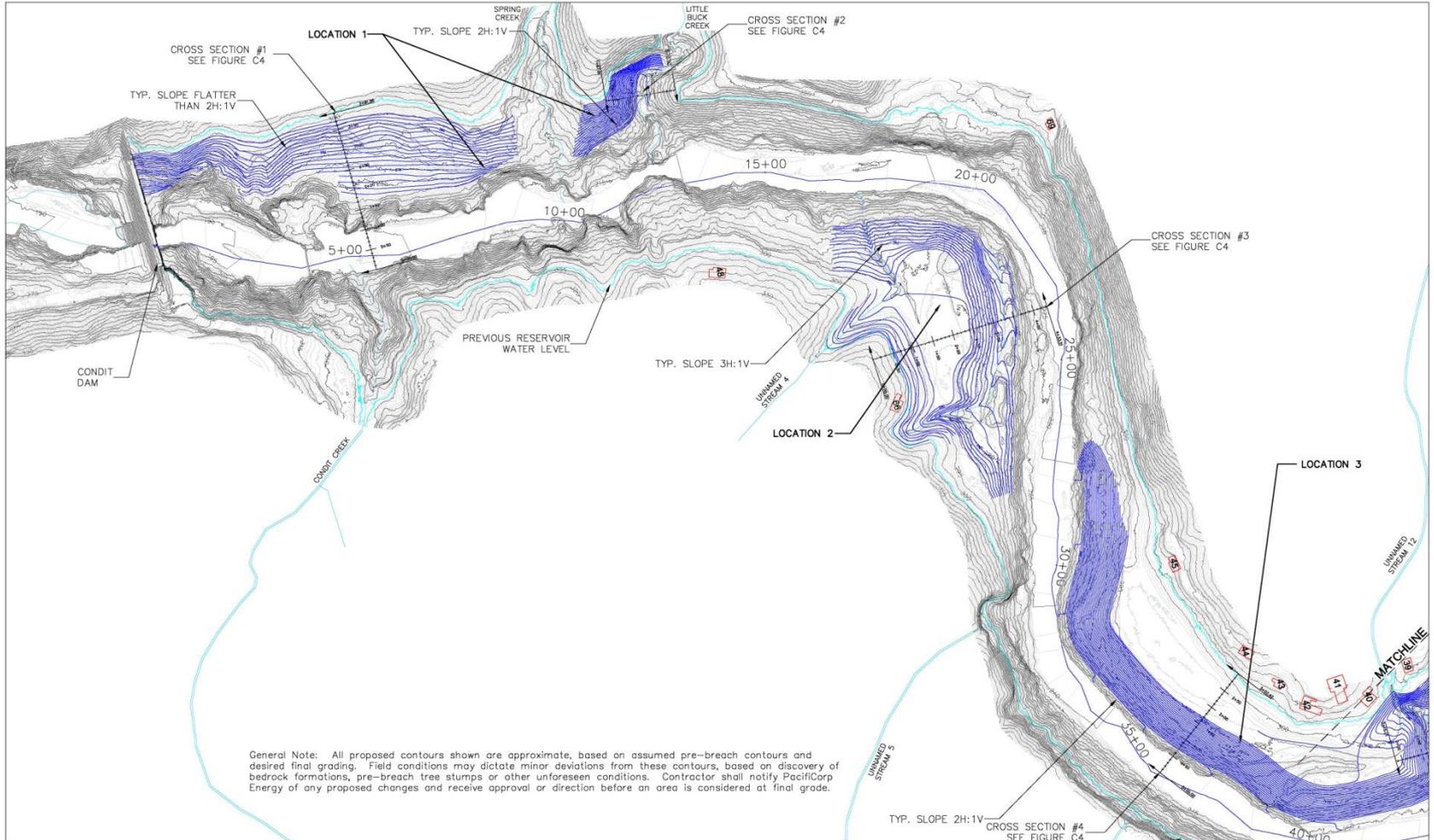


# Post Breach Activities

## Old Cofferddam - Removed

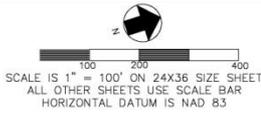


# Grading



General Note: All proposed contours shown are approximate, based on assumed pre-breach contours and desired final grading. Field conditions may dictate minor deviations from these contours, based on discovery of bedrock formations, pre-breach tree stumps or other unforeseen conditions. Contractor shall notify PacifiCorp Energy of any proposed changes and receive approval or direction before an area is considered at final grade.

- # EXISTING CABINS
- 12.21.2011 LIDAR CONTOURS (1 FT CONTOUR INTERVALS)
- PROPOSED CONTOURS (2 FT. CONTOUR INTERVALS)



**JR MERIT**  
INDUSTRIAL CONTRACTORS

**PACIFICORP ENERGY**  
A DIVISION OF PACIFICORP

**RIVERBEND ENGINEERING, LLC**  
102 3rd Street Pappas Springs, CO 81147  
Tel: 970.264.1195 FAX: 970.264.1196  
www.riverendlocation.com

CONDIT DAM DECOMMISSIONING

**FIGURE C1**  
**PROPOSED GRADING PLAN**  
**SOUTH SECTION**

Scale: 1" = 100 ft      2/20/2012

# Post Breach Activities

Sediment management – the former reservoir



# Post Breach Activities

Sediment management – the former reservoir



# Post Breach Activities

Sediment management – the former reservoir



# Post Breach Activities

Sediment management – the former reservoir



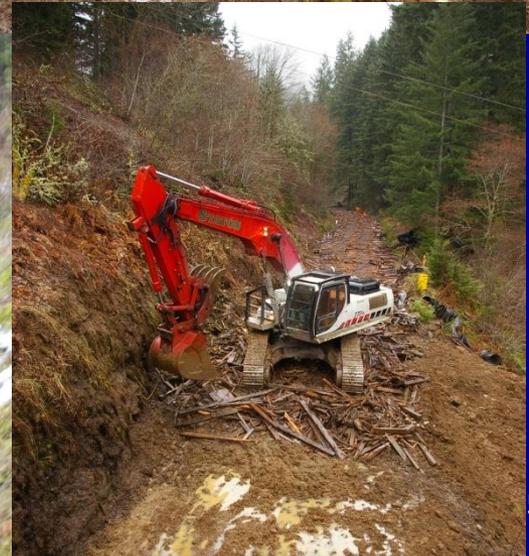
# Post Breach Activities

Sediment management – the former reservoir



# Post Breach Activities

## Demolition - Flowline



# Post Breach Activities

## Demolition - Dam



# Post Breach Activities

## Demolition - Dam



# Post Breach Activities

## Demolition - Dam



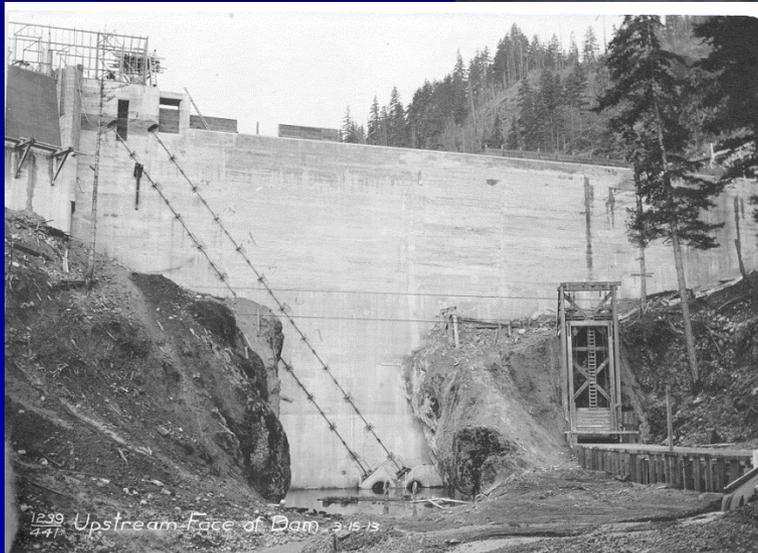
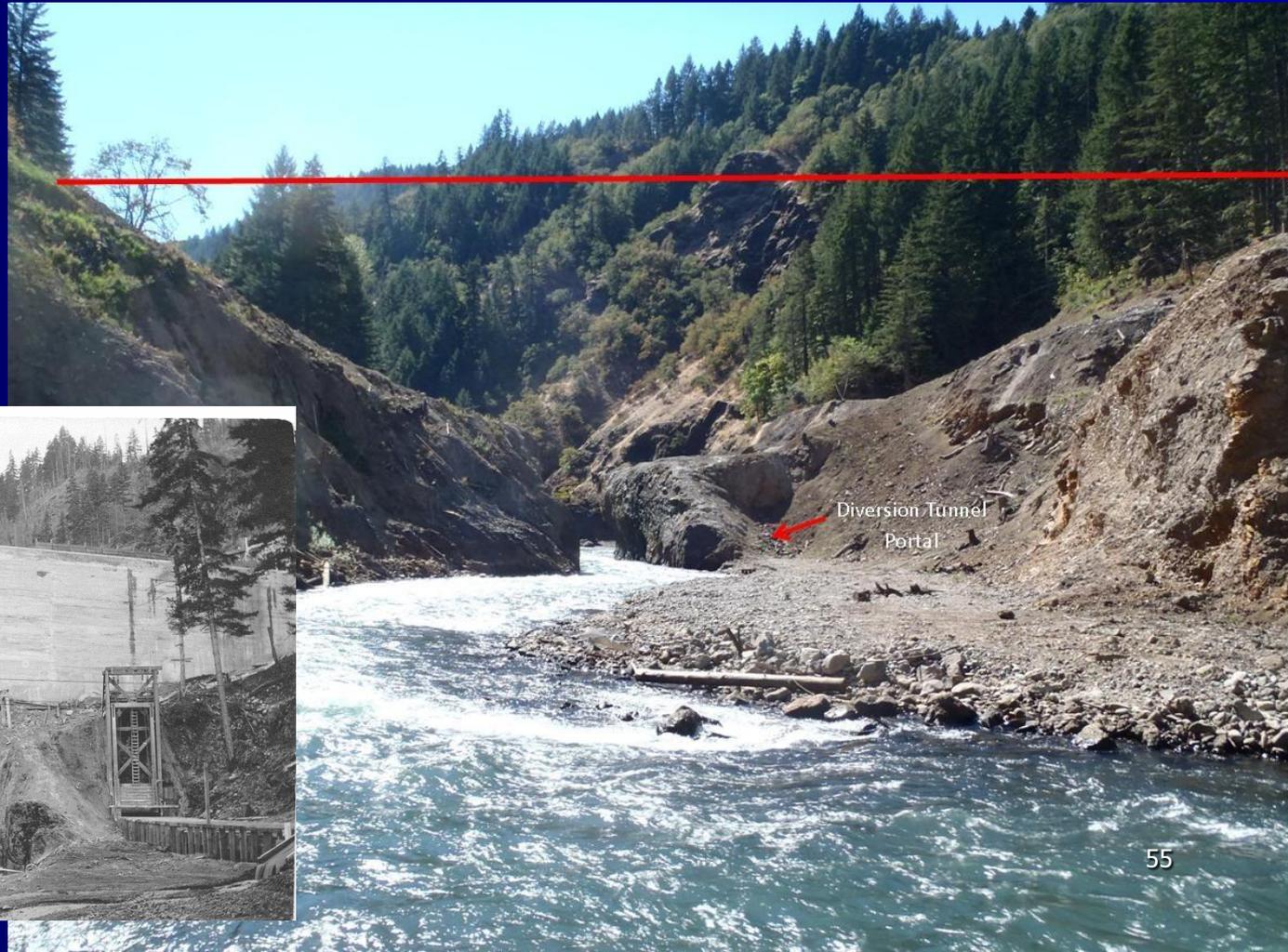
# Post Breach Activities

## Demolition - Dam



# Post Breach Activities

## Demolition – Dam Removed



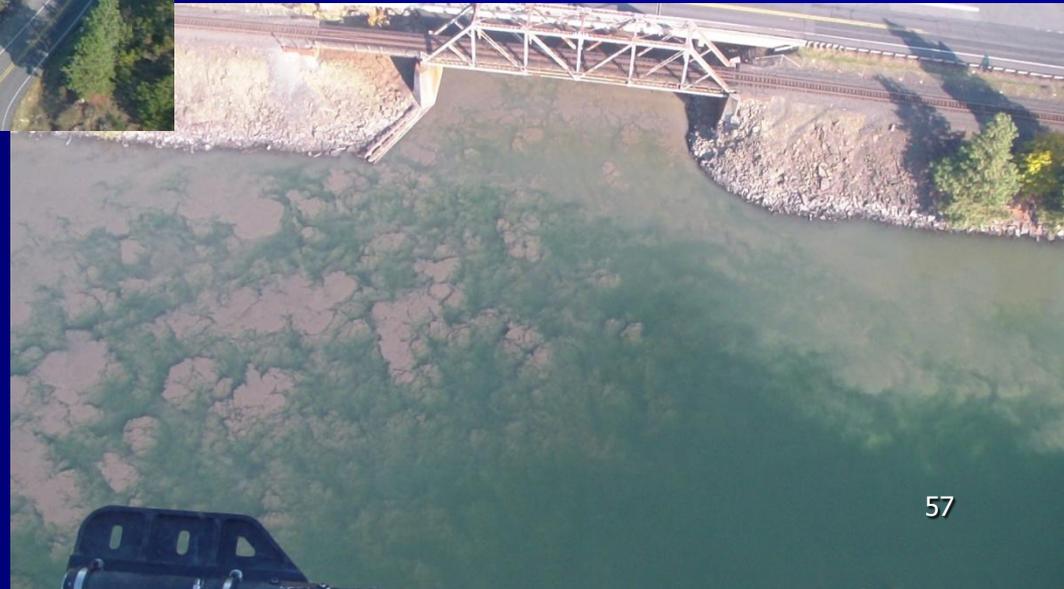


# Post Breach Activities

Demolition – Dam  
Removed

# Post Breach Activities

Sediment monitoring and assessment  
mouth of White Salmon River



# Post Breach Activities

Sediment monitoring - mid-January 2012  
mouth of White Salmon River



# Future Activities

- Tree planting
- Ongoing monitoring of vegetation establishment
- Water quality monitoring
- Site monitoring for slope stability
- Public safety
- Monitoring delta at mouth of White Salmon River

For more information please visit:

[www.pacificorp.com/condit](http://www.pacificorp.com/condit)